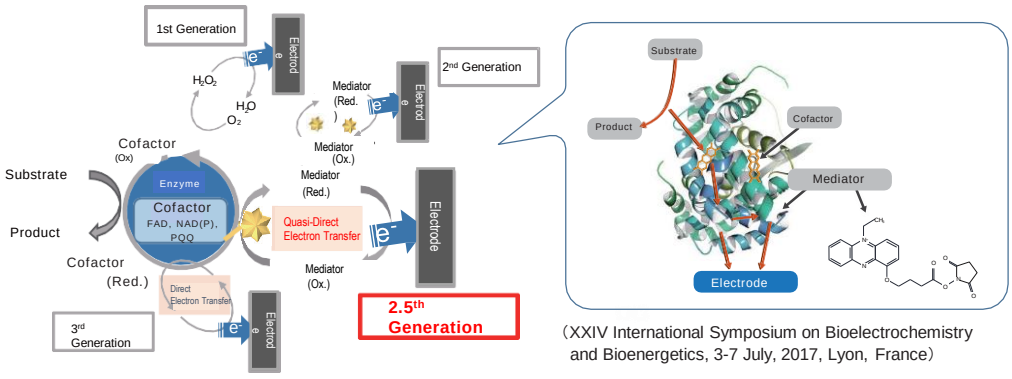
A New Amine-reactive Electron Mediator for Biosensors

Amine-reactive PES

An amine-reactive phenazine ethosulfate “Amine-Reactive PES” is able to be linked to enzymes by a covalent bond, and so is expected to be applied to next generation sensors.

New Generation Biosensor

By modification of enzyme with Amine-reactive PES, the mediator which binds to the enzyme surface is able to transfer the electrons from reduced cofactor to the electrode. This sensing system may be useful for reducing mediator leakage from the electrode and replacement of expensive metal complex compounds.



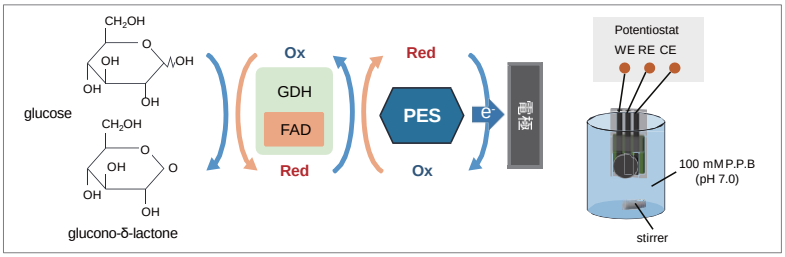
（XXIV International Symposium on Bioelectrochemistry and Bioenergetics, 3-7 July, 2017, Lyon, France）

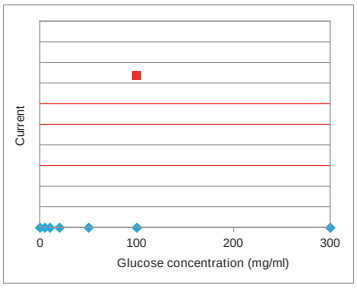
Journal

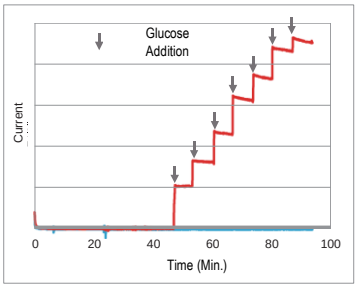
Stefano Ferri, Katsuhiro Kojima and Koji SODE, “Review of Glucose Oxidases and Glucose Dehydrogenases: A Bird’ s Eye View of Glucose Sensing Enzymes”. *Journal of Diabetes Science and Technology*, **2011**, *5*(5),1068

Example: Electrochemical measurement of glucose

Chronoamperometry （0 mV vs Ag/AgCl）







Unmodified FADGDH

PES modified FADGDH

The concentration of glucose was measured by modifying enzyme using Amine-reactive PES and this sensing system has the potential to develop continuous monitoring for various target molecules such as glucose

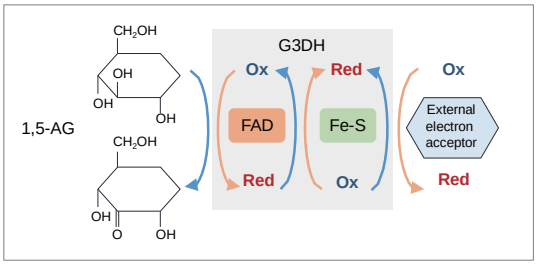
NEXT Features and PES-modification procedure

New Electron Mediator for Biosensors

Amine-reactive PES

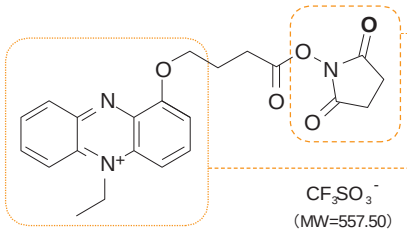
The sensing system is applicable to the following enzymes

- FAD-FAD-dependent glucose dehydrogenase (FAD-GDH)
- L-Lactate oxidase（LOx）
- Fructosyl amino acid oxidase（FAOx）
- Cholesterol oxidase（ChOx）
- Pyranose oxidase（PyOx）



Features of Amine-reactive PES

Structure of Amine-reactive PES



$CF_3SO_3^-$
(MW=557.50)

Succinimide group
・React with amine group

+

Phenazine ethosulfate（PES）
・Low oxidation potential
（around-250 mV vs Ag / AgCl）
→hardly affected by interreferences

Procedure for PES-modification

Easy procedure: Just mix enzyme and Amine-reactive PES

- Enzyme
- Amine-reactive PES
- Tricine buffer（pH8.3）

→ Incubation（25℃, 1200 rpm, 2 hrs）

→ Purification (removal of excess Amine-reactive PES)

→ Concentration (ultrafiltration) (4℃, 14000 x *g*, 5 min x 10)

→ PES modified enzyme

Product Name	Unit	Code
Amine-reactive PES	10 mg	A543

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Electron Mediator	**1-Methoxy PMS**
Stable Electron Mediator	**1-Methoxy PES**

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